

REMARKS

Claims 1, 15, and 25 are currently being amended to further particularly point out and distinctly claim the subject matter which Applicant regards as the inventive subject matter. Additionally, claim 14 is being cancelled without prejudice or disclaimer to the subject matter expressed therein. Moreover, claim 18 is currently being amended to obviate the Examiner's objection, and claim 27 is currently being amended to conform the claim to U.S. practice.

These amendments do not introduce new matter within the meaning of 35 U.S.C. §132. Accordingly, entry of the amendments prior to examination is respectfully requested.

1. Objection of Claims 14 and 18

The Office Action states,

Claims 14 and 18 are objected to because of the following informalities: (a) claim 14, line 3, "R" is suggested to be changed to --R¹-- and (b) claim 18, line 2, "Al trialkyl compound" is suggested to be changed to --aluminum trialkyl compound--.

RESPONSE

Claim 14 has been cancelled rendering the above objection moot. With respect to claim 18, Applicant has amended "Al trialkyl compound" to "aluminum trialkyl compound" as suggested by the Examiner. Accordingly, Applicant respectfully requests the Examiner to withdraw the objections.

2. Rejection of Claims 1-18 Under 35 U.S.C. §102(b)

The Office Action states that claims 1-18 are rejected under 35 U.S.C. §102(b) as being anticipated by Goeke, et al. (EP 0 004 647 A2). In particular, the Office Action states,

Goeke et al. disclose a catalyst comprising (A) a precursor in the formula of $Mg_mTi_1(OR)_nX_p[ED]_q$ and (B) an activator having the formula of $Al(R'')_cX'dHe$; wherein the precursor is the contact product of a titanium compound $[Ti(OR)_aX_b]$, a magnesium compound $[MgX_2]$, and an electron donor and $Mg/Ti =$ about 0.5-56 (preferably about 1 to 10); electron donor/Ti = about 2-85 (preferably about 3 to 10) (page 12-14; claim 1). Goeke et al. further disclose that the electron donor is alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers, and aliphatic ketones - tetrahydrofuran and ethyl acetate being exemplified; the activator is $Al(C_2H_5)_3$, $Al(C_2H_5)_2Cl$, $Al(i-C_4H_9)_3$, $Al(C_6H_{13})_3$, $Al(C_8H_{17})_3$, or mixtures thereof (page 14, lines 1-11 and 27-31; claim 1). Thus, the present claims are anticipated by the disclosure of Goeke et al.

RESPONSE

Applicant respectfully traverses the rejection of claims 1-18.

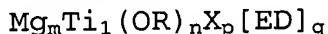
For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully believes EP 0 004 647 A2 (referred to herein as Goeke, et al.) fails to disclose, teach, or suggest, "A solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

In particular, Applicant believes Goeke, et al. fails to disclose, teach, or suggest solid catalyst components comprising a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, and wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5.. See MPEP §2131.

In fact, Goeke, et al. discloses on page 16, lines 25-30,

When thus made as disclosed above the precursor composition has the formula



Wherein ED is the electron donor compound,

m is ≥ 0.5 to ≤ 56 , and preferably ≥ 1.5 to ≤ 5 , . . .

. . .

However, in order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." See MPEP 2131.03, section II. Additionally, the identical invention must be shown in as complete detail as is contained in the claim.

Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). Accordingly, Applicant respectfully believes the extremely broad and generic Mg/Ti ratio disclosed in Goeke, et al. does not anticipate Applicant's currently claimed Mg/Ti ratio of higher than 5.

In light of the above, claims 1-18 are therefore believed to be patentable over Goeke, et al. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

3. Rejection of Claims 25-27 Under 35 U.S.C. §102(b)

The Office Action states that claims 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Goeke, et al. (EP 0 004 647 A2). In particular, the Office Action states,

Goeke et al. disclose a process to form a copolymer of ethylene and a comonomer in gas phase in the presence of catalyst which comprises (A) a precursor in the formula of $Mg_mTi_1(OR)_nX_p[ED]_q$ and (B) an activator having the formula of $Al(R'')_cX'_dH_e$; wherein the precursor is the contact product of a titanium compound $[Ti(OR)_aX_b]$, a magnesium compound $[MgX_2]$, and an electron donor - Mg/Ti = about 0.5-56 (preferably about 1 to 10) and electron donor/Ti = about 2-85 (preferably about 3 to 10); the electron donor is alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers, and aliphatic ketones - tetrahydrofuran and ethyl acetate being exemplified; the activator is $Al(C_2H_5)_3$, $Al(C_2H_5)_2Cl$, $Al(i-C_4H_9)_3$, $Al(C_6H_{13})_3$, $Al(C_8H_{17})_3$, or mixtures thereof; the comonomer is C_{3-8} comonomer in an amount of at least 1 to 10 mol % (page 12-14 - especially page 14, lines 1-11 and 27-31; page 19, lines 31-37; page 20, lines 1-30; claim 1). Thus, the present claims are anticipated by the disclosure of Goeke et al.

RESPONSE

Applicant respectfully traverses the rejection of claims 25-27.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

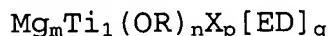
Applicant respectfully believes EP 0 004 647 A2 (referred to herein as Goeke, et al.) fails to disclose, teach, or suggest, "A process comprising (co)polymerizing olefins $\text{CH}_2=\text{CHR}$, wherein R is hydrogen or a hydrocarbon radical having 1-12 carbon atoms, carried out in the presence of a catalyst comprising a product obtained by contacting:

- (a) a solid catalyst component comprising Mg, a titanium compound selected from titanium tetrahalides, or of formula $\text{TiX}_n(\text{OR}^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is $\text{C}_1\text{-C}_{10}$ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5;
- (b) at least one aluminum alkyl compound and, optionally,
- (c) an external electron donor compound."

In particular, Applicant believes Goeke, et al. fails to disclose, teach, or suggest solid catalyst components comprising a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, and wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5. See MPEP §2131.

In fact, Goeke, et al. discloses on page 16, lines 25-30,

When thus made as disclosed above the precursor composition has the formula



Wherein ED is the electron donor compound,
 m is ≥ 0.5 to ≤ 56 , and preferably ≥ 1.5 to ≤ 5 ,

However, in order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." See MPEP 2131.03, section II. Additionally, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). Accordingly, Applicant respectfully believes the extremely broad and generic Mg/Ti ratio disclosed in Goeke, et al. does not anticipate Applicant's currently claimed Mg/Ti ratio of higher than 5.

In light of the above, claims 25-27 are therefore believed to be patentable over Goeke, et al. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

4. Rejection of Claims 1-8 and 10-13 Under 35 U.S.C. §102(b)

The Office Action states that claims 1-8 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ala-Hulkku, et al. (EP 0 416 928 A2). In particular, the Office Action states,

Ala-Hulkku et al. disclose a procatalyst comprising a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface, wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)]; the magnesium compound is preferably magnesium dichloride ($MgCl_2$) (abstract; page 3, lines 39-47; page 4, lines 18-20; page 5, lines 52; claim 5). Thus, the present claims are anticipated by the disclosure of Ala-Hulkku et al.

RESPONSE

Applicant respectfully traverses the rejection of claims 1-8 and 10-13.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). The elements must also be arranged as

required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully believes EP 0 416 928 A2 (referred to herein as Ala-Huikku, et al.) fails to disclose, teach, or suggest, "A solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

In particular, Applicant believes Huikku, et al. fails to disclose, teach, or suggest solid catalyst components comprising a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, and wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5. See MPEP §2131.

In fact, Ala-Huikku, et al. relates to a catalyst system having monocyclopentadienyl titanium tetrachloride or monocyclopentadienyl titanium trichloride as the titanium compound. See page 3, lines 18-20, and page 3, lines 42-43.

In light of the above, claims 1-8 and 10-13 are therefore believed to be patentable over Ala-Huikku, et al. Accordingly, reconsideration and withdrawal of the rejection is requested.

5. Rejection of Claims 15-17 and 22-23 Under 35 U.S.C. §102(b)

The Office Action states that claims 15-17 and 22-23 are rejected under 35 U.S.C. §102(b) as being anticipated by Ala-Hulkku, et al. (EP 0 416 928 A2). In particular, the Office Action states,

Ala-Hulkku et al. disclose a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/ Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)] (abstract; page 3, lines 39-51 ; page 4, lines 18-20; page 5, lines 52; claim 5). Ala-Hulkku et al. further disclose that ". . . procatalyst was suspended in . . . pentane and . . . alkyl aluminum was added to it. . . . The mixture was agitated at room temperature in nitrogen flow for about 20 minutes" (page 5, lines 51-54). Thus, the present claims are anticipated by the disclosure of Ala-Hulkku et al.

RESPONSE

Applicant respectfully traverses the rejection of claims 15-17 and 22-23.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed.

Cir. 1989), (Emphasis added). The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully believes EP 0 416 928 A2 (referred to herein as Ala-Huikku, et al.) fails to disclose, teach, or suggest, "A catalyst for the polymerization of olefins comprising a product obtained by contacting:

- (a) a solid catalyst component comprising Mg, a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5;
- (b) at least one aluminum alkyl compound and, optionally,
- (c) an external electron donor compound."

In particular, Applicant believes Huikku, et al. fails to disclose, teach, or suggest solid catalyst components comprising a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, and wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5." See MPEP §2131.

In fact, Ala-Huikku, et al. relates to a catalyst system having monocyclopentadienyl titanium tetrachloride or monocyclopentadienyl titanium trichloride as the titanium compound. See page 3, lines 18-20, and page 3, lines 42-43.

In light of the above, claims 15-17 and 22-23 are therefore

believed to be patentable over Ala-Huikku, et al. Accordingly, reconsideration and withdrawal of the rejection is requested.

6. Rejection of Claim 25 Under 35 U.S.C. §102(b)

The Office Action states that claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by Ala-Huikku, et al. (EP 0 416 928 A2). In particular, the Office Action states,

Ala-Hulkku et al. disclose a process for olefin (co)polymerization in the presence of a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1 - 10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)]; olefin is ethylene or a combination of ethylene and α -olefin (abstract; page 3, lines 39-51; page 4, lines 18-20; page 5, lines 52; page 6, lines 1-19; claim 5). Thus, the present claims are anticipated by the disclosure of Ala-Hulkku et al.

RESPONSE

Applicant respectfully traverses the rejection of claim 25.

For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the

claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), (Emphasis added). The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully believes EP 0 416 928 A2 (referred to herein as Ala-Huikku, et al.) fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C₁-C₁₀ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5. . . ."

In particular, Applicant believes Huikku, et al. fails to disclose, teach, or suggest solid catalyst components comprising a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C₁-C₁₀ hydrocarbon group, and wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5." See MPEP §2131.

In fact, Ala-Huikku, et al. relates to a catalyst system having monocyclopentadienyl titanium tetrachloride or monocyclopentadienyl titanium trichloride as the titanium compound. See page 3, lines 18-20, and page 3, lines 42-43.

In light of the above, claim 25 is therefore believed to be patentable over Ala-Huikku, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

7. Rejection of Claims 19-20 Under 35 U.S.C. §103(a)

The Office Action states that claims 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Goeke, et al. (EP 0 004 647 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Goeke et al. disclose a catalyst comprising (A) a precursor in the formula of $Mg_mTi_1(OR)_nX_p[ED]_q$ and (B) an activator having the formula of $Al(R'')_cX'dH_e$; wherein the precursor is the contact product of a titanium compound $[Ti(OR)_aX_b]$, a magnesium compound $[MgX_2]$, and an electron donor and Mg/Ti = about 0.5-56 (preferably about 1 to 10); electron donor/Ti = about 2-85 (preferably about 3 to 10) (page 12-14; claim 1). Goeke et al. further disclose that the electron donor is tetrahydrofuran; the activator is $Al(C_2H_5)_3$, $Al(C_2H_5)_2Cl$, $Al(i-C_4H_9)_3$, $Al(C_6H_{13})_3$, $Al(C_8H_{17})_3$, or mixtures thereof (page 14, lines 1-11 and 27-31; claim 1).

The difference between the present claims and the disclosure of Goeke et al. is the requirement of an external electron donor which is an aliphatic ether or tetrahydrofuran to be used in the present invention.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that "[t]he external donor is used to confer to the catalyst the required high stereospecificity. However, when particular diethers are employed as internal donors, the catalyst stereospecificity is sufficiently high and no external donor is required" (page 7, lines 15-20). In other words, if the internal electron donor is not diether, an external electron donor is required to obtain the high stereospecificity [motivation]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tetrahydrofuran as the external electron donor in the disclosure of Goeke et al. to obtain the high stereospecificity and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claims 19-20.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Goeke, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Goeke, et al.

As discussed *supra*, Applicant respectfully believes Goeke, et al. fails to disclose, teach, or suggest, "A solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R¹ is C₁-C₁₀ hydrocarbon

group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency of Goeke, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Goeke, et al., along with the differences acknowledged by the Examiner on page 8, lines 1-3, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claims 19-20 are not obvious over Goeke, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 19-20 are therefore believed to be patentable over Goeke, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

8. Rejection of Claims 19-20 Under 35 U.S.C. §103(a)

The Office Action states that claims 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ala-Huikku, et al. (EP 0 416 928 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Ala-Hulkku et al. disclose a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/ Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)](abstract; page 3, lines 39-51 ; page 4, lines 18-20; page 5, lines 52; claim 5).

The difference between the present claims and the disclosure of Ala-Hukku et al. is the requirement of an external electron donor which is an aliphatic ether or tetrahydrofuran to be used in the present invention.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that "[t]he external donor is used to confer to the catalyst the required high stereospecificity. However, when particular diethers are employed as internal donors, the catalyst stereospecificity is sufficiently high and no external donor is required" (page 7, lines 15-20). In other words, if the internal donor is not diether, an external electron donor is required to obtain the high stereospecificity [motivation]. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use tetrahydrofuran as the external electron donor in the disclosure of Ala-Hukku et al. to obtain the high stereospecificity and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claims 19-20.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Ala-Huikku, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Ala-Huikku, et al.

As discussed *supra*, Applicant respectfully believes Ala-Huikku, et al. fails to disclose, teach, or suggest, "A solid catalyst component for the polymerization of olefins comprising Mg, a

titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency of Ala-Huikku, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one or ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Ala-Huikku, et al., along with the differences acknowledged by the Examiner on page 9, lines 7-9, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claims 19-20 are not obvious over Ala-Huikku, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 19-20 are therefore believed to be patentable over Ala-Huikku, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is

respectfully requested.

9. Rejection of Claim 21 Under 35 U.S.C. §103(a)

The Office Action states that claim 21 is rejected under 35 U.S.C. §103(a) as being unpatentable over Goeke, et al. (EP 0 004 647 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Goeke et al. disclose a catalyst comprising (A) a precursor in the formula of $Mg_mTi_1(OR)_nX_p[ED]_q$ and (B) an activator having the formula of $Al(R'')_cX'dHe$; wherein the precursor is the contact product of a titanium compound $[Ti(OR)_aX_b]$, a magnesium compound $[MgX_2]$, and an electron donor and $Mg/Ti =$ about 0.5-56 (preferably about 1 to 10); electron donor/Ti = about 2-85 (preferably about 3 to 10) (page 12-14; claim 1). Goeke et al. further disclose that the electron donor is alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers, and aliphatic ketones - tetrahydrofuran and ethyl acetate being exemplified; the activator is $Al(C_2H_5)_3$, $Al(C_2H_5)_2Cl$, $Al(i-C_4H_9)_3$, $Al(C_6H_{13})_3$, $Al(C_8H_{17})_3$, or mixtures thereof (page 14, lines 1-11 and 27-31; claim 1).

The difference between the present claim and the disclosure of Goeke et al. is the requirement of the external electron donor to be a specific silicon compound.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that "[w]hen the internal donor is an ester. . . . the external donor is preferably selected from the silicon compounds of the formula $R_1R_2Si(OR)_2$" to obtain the high stereospecificity [motivation] (page 7, lines 15-16; page 6, lines 13-16). In light of such benefit, it would have been obvious to use the specific silicon compound in the disclosure of Goeke et al. to obtain the high stereospecificity and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claim 21.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Goeke, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Goeke, et al.

As discussed *supra*, Applicant respectfully believes Goeke, et al. fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R¹ is C₁-C₁₀ hydrocarbon

group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency of Goeke, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one or ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Goeke, et al., along with the differences acknowledged by the Examiner on page 10, lines 13-14, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claim 21 is not obvious over Goeke, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 21 is therefore believed to be patentable over Goeke, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

10. Rejection of Claim 21 Under 35 U.S.C. §103(a)

The Office Action states that claim 21 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ala-Hulkku, et al. (EP 0 416 928 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Ala-Hulkku et al. disclose a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/ Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)](abstract; page 3, lines 39-51 ; page 4, lines 18-20; page 5, lines 52; claim 5). Ala-Hulkku et al. further disclose that ". . . . procatalyst was suspended in. . . . pentane and alkyl aluminum was added to it. . . . The mixture was agitated at room temperature in nitrogen flow for about 20 minutes" (page 5, lines 51-54). Thus, the present claims are anticipated by the disclosure of Ala-Hulkku et al.

The difference between the present claim and the disclosure of Ala-Hulkku et al. is the requirement of the external electron donor to be a specific silicon compound.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that "[w]hen the internal donor is an ester. . . . the external donor is preferably selected from the silicon compounds of the formula $R_1R_2Si(OR)_2$" to obtain the high spereospecificity [motivation] (page 7, lines 15-16; page 6, lines 13-16). In light of such benefit, it would have been obvious to use the specific silicon compound in the disclosure of Ala-Hulkku et al. to obtain the high stereospecificity and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claim 21.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Ala-Huikku, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Ala-Huikku, et al.

As discussed *supra*, Applicant respectfully believes Ala-Huikku, et al. fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R¹ is C₁-C₁₀ hydrocarbon

group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency of Ala-Huikku, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one or ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Ala-Huikku, et al., along with the differences acknowledged by the Examiner on page 11, lines 19-20, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claim 21 is not obvious over Ala-Huikku, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 21 is therefore believed to be patentable over Ala-Huikku, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

11. Rejection of Claim 24 Under 35 U.S.C. §103(a)

The Office Action states that claim 24 is rejected under 35 U.S.C. §103(a) as being unpatentable over Goeke, et al. (EP 0 004 647 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Goeke et al. disclose a catalyst comprising (A) a precursor in the formula of $Mg_mTi_1(OR)_nX_p[ED]_q$ and (B) an activator having the formula of $Al(R'')_cX'dH_e$; wherein the precursor is the contact product of a titanium compound [$Ti(OR)_aX_b$], a magnesium compound [MgX_2], and an electron donor and Mg/Ti = about 0.5-56 (preferably about 1 to 10); electron donor/Ti = about 2-85 (preferably about 3 to 10) (page 12-14; claim 1). Goeke et al. further disclose that the electron donor is alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers, and aliphatic ketones; the activator is aluminum alkyl or aluminum alkyl (page 14, lines 1-11 and 27-31; claim 1).

The difference between the present claim and the disclosure of Goeke et al. is the requirement of the catalyst to be pre-polymerized to have the specific amount of the polymer.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that the catalyst is undergone pre-polymerization treatment with ethylene and/or alpha-olefin to obtain a prepolymerized catalyst having polymer in an amount from about 1 to about 1,000 g polymer per g of the catalyst (page 25, lines 17-24). The pre-polymerization treatment "allow to control the polymerization process in the gas phase without the drawbacks. . . . which are essentially due to the low heat transfer capability of the gas phase and to the formation of electrostatic charges, which determine the catalyst and the polymer particles to adhere to the reactor walls" [motivation] (page 6, lines 7-13). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pre-polymerized catalyst in the disclosure of Goeke et al. to avoid fouling and thereby obtain the

present invention.

RESPONSE

Applicant respectfully traverses the rejection of claim 24.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Goeke, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Goeke, et al.

As discussed *supra*, Applicant respectfully believes Goeke, et al. fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula

$TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C_1-C_{10} hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency of Goeke, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one or ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Goeke, et al., along with the differences acknowledged by the Examiner on page 12, line 21 - page 13, line 2, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claim 24 is not obvious over Goeke, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 24 is therefore believed to be patentable over Goeke, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

12. Rejection of Claim 24 Under 35 U.S.C. §103(a)

The Office Action states that claim 24 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ala-Hulkku, et al. (EP 0 416 928 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Ala-Hulkku et al. disclose a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/ Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)] (abstract; page 3, lines 39-51 ; page 4, lines 18-20; page 5, lines 52; claim 5).

The difference between the present claim and the disclosure of Ala-Hulkku et al. is the requirement of the catalyst to be pre-polymerized to have the specific amount of the polymer.

Govoni et al. disclose a catalyst comprising (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that the catalyst is undergone pre-polymerization treatment with ethylene and/or alpha-olefin to obtain a prepolymerized catalyst having polymer in an amount from about 1 to about 1,000 g polymer per g of the catalyst (page 25, lines 17-24). The pre-polymerization treatment "allow to control the polymerization process in the gas phase without the drawbacks. . . . which are essentially due to the low heat transfer capability of the gas phase and to the formation of electrostatic charges, which determine the tendency of the catalyst and the polymer particles to adhere to the reactor walls" [motivation] (page 6, lines 7-13). In light of such benefit, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to use pre-polymerized catalyst in the disclosure of Ala-Hulkku et al. to avoid fouling and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claim 24.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Ala-Huikku, et al. are incorporated herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Ala-Huikku, et al.

As discussed *supra*, Applicant respectfully believes Ala-Huikku, et al. fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a

titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R¹ is C₁-C₁₀ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency in Ala-Huikku, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Ala-Huikku, et al., along with the differences acknowledged by the Examiner on page 14, lines 7-9, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant respectfully believes currently pending claim 24 is not obvious over Ala-Huikku, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 24 is therefore believed to be patentable over Ala-Huikku, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is

respectfully requested.

13. Rejection of Claim 28 Under 35 U.S.C. §103(a)

The Office Action states that claim 28 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ala-Hulkku, et al. (EP 0 416 928 A2) in view of Govoni, et al. (WO 93/03078). In particular, the Office Action states,

Ala-Hulkku et al. disclose a process to polymerize ethylene in the presence of a catalyst comprising (A) a solid carrier with a magnesium compound, an electron donor compound, and monocyclopentadienyl titanium trichloride on its surface and (B) a cocatalyst which is preferably trialkylaluminum or alkylaluminum halide; wherein the electron donor is an alkyl ester of a carboxylic acid, an aliphatic ester, a cyclic ether, or an aliphatic ketone and tetrahydrofuran is exemplified as the electron donor; Mg/Ti = 1-10 [Ti/Mg = 0.1 to 1.0]; electron donor/Ti = 0.05-4.5 [electron donor/ Mg = electron donor/Ti = (0.5-4.5)(0.1-1.0)]; olefin is ethylene or a combination of ethylene and α -olefin (abstract; page 3, lines 39-51; page 4, lines 18-20; page 5, lines 52; page 6, lines 1-19; claim 5). Ala-Hulkku et al. further disclose that ". . . . procatalyst was suspended in pentane and alkyl aluminum was added to it. . . . The mixture was agitated at room temperature in nitrogen flow for about 20 minutes" (page 5, lines 51-54).

The difference between the present claim and the disclosure of Ala-Hulkku et al. is the requirement of the process for olefin polymerization, comprising the catalyst to be pre-polymerized.

Govoni et al. disclose a process to polymerize ethylene in the presence of a catalyst which comprises (A) a solid component comprising a titanium compound containing at least one titanium-halogen bond supported on a magnesium halide in active form and an internal donor, (B) an alkyl aluminum compound, and optionally (C) an external donor which is the same or different type with respect to the internal donor (pages 6-7). Govoni et al. further disclose that the catalyst is undergone pre-polymerization treatment

with ethylene and/or alpha-olefin to obtain a prepolymerized catalyst having polymer in an amount from about 1 to about 1,000 g polymer per g of the catalyst (page 25, lines 17-24). The pre-polymerization treatment "allow to control the polymerization process in the gas phase without the drawbacks. . . . which are essentially due to the low heat transfer capability of the gas phase and to the formation of electrostatic charges, which determine the tendency of the catalyst and the polymer particles to adhere to the reactor walls" [motivation] (page 6, lines 7-13). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pre-polymerized catalyst in the disclosure of Ala-Huikku et al. to avoid fouling and thereby obtain the present invention.

RESPONSE

Applicant respectfully traverses the rejection of claim 28.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments *supra* regarding Ala-Huikku, et al. are incorporated

herein by reference in their entirety. Additionally, Applicant respectfully believes Govoni, et al. does not remedy the deficiencies of Ala-Huikku, et al.

As discussed *supra*, Applicant respectfully believes Ala-Huikku, et al. fails to disclose, teach, or suggest, ". . . a solid catalyst component for the polymerization of olefins comprising Mg, a titanium compound selected from titanium tetrahalides or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R¹ is C₁-C₁₀ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5."

Additionally, Applicant respectfully believes Govoni, et al. fails to remedy this deficiency in Ala-Huikku, et al.

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one or ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. See MPEP §2142.

Accordingly, given the aforementioned differences between Ala-Huikku, et al., along with the differences acknowledged by the Examiner on page 15, lines 17-19, and along with the fact that Govoni, et al. fails to remedy these deficiencies, Applicant

respectfully believes currently pending claim 28 is not obvious over Ala-Huikku, et al. in view of Govoni, et al., and that the Examiner has not established a *prima facie* case of obviousness.

In light of the above, claim 28 is therefore believed to be patentable over Ala-Huikku, et al. in view of Govoni, et al. As such, reconsideration and withdrawal of the rejection is respectfully requested.

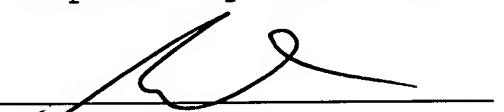
CONCLUSION

Based upon the above remarks, the presently claimed subject matter is believed to be novel and patentably distinguishable over the references of record. The Examiner is therefore respectfully requested to reconsider and withdraw all rejections and allow all pending claims 1-28. Favorable action with an early allowance of the claims pending in this application is earnestly solicited.

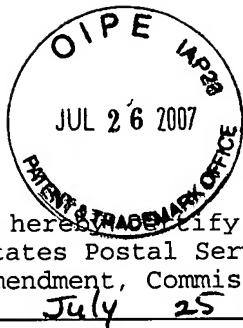
The Examiner is welcomed to telephone the undersigned practitioner with any questions or comments.

Respectfully submitted,

By:

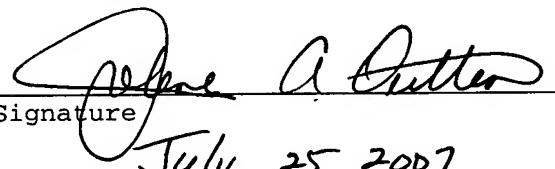

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Serial No. 10/537,077

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on July 25 2007.


Signature

July 25 2007
Date



ATTACHMENT A

1. (Currently amended) A solid catalyst component for the polymerization of olefins comprising Mg, [[Ti]] a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is C₁-C₁₀ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5.
2. (Original) The solid catalyst component according to claim 1, in which the ED compound is selected from the group consisting of ethers, esters and ketones.
3. (Original) The solid catalyst component according to claim 2, in which the ED compound is selected from the C₂-C₂₀ aliphatic ethers.
4. (Original) The solid catalyst component according to claim 3, in which the ethers are cyclic ethers.
5. (Original) The solid catalyst component according to claim 4, in which the cyclic ethers have 3-5 carbon atoms.
6. (Original) The solid catalyst component according to claim 5, in which the cyclic ether is tetrahydrofuran.
7. (Previously presented) The solid catalyst component

according to claim 2, in which the ED compound is selected from alkyl esters of C1-C20 aliphatic carboxylic acids.

8. (Previously presented) The solid catalyst component according to claim 7, in which the alkyl esters are selected from C1-C4 alkyl esters of aliphatic mono carboxylic acids.

9. (Previously presented) The solid catalyst component according to claim 8, in which the alkyl ester is ethylacetate.

10. (Original) The solid catalyst component according to claim 1, in which the ED/Ti molar ratio ranges from 3.7 to 40.

11. (Previously presented) The solid catalyst component according to claim 10, in which the ED/Ti molar ratio ranges from 4.5 to 30.

12. (Original) The solid catalyst component according to claim 1, in which the Mg/Ti molar ratio ranges from 7 to 120.

13. (Original) The solid catalyst component according to claim 1, in which the Mg atoms derive from MgCl₂.

14. (Cancelled)

15. (Currently amended) A catalyst for the polymerization of olefins comprising a product obtained by contacting:

- (a) a solid catalyst component comprising Mg, $[[\text{Ti}]]$ a titanium compound selected from titanium tetrahalides, or of formula $\text{TiX}_n(\text{OR}^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen, and R^1 is $\text{C}_1\text{-C}_{10}$ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5;
- (b) at least one aluminum alkyl compound and, optionally,
- (c) an external electron donor compound.

16. (Original) The catalyst according to claim 15, in which the aluminum alkyl compound is an Al trialkyl.

17. (Original) The catalyst according to claim 15, in which the aluminum alkyl compound is an aluminum alkyl halide.

18. (Currently amended) The catalyst according to claim 15, in which the aluminum alkyl compound is a product obtained by mixing an $[[\text{Al}]]$ aluminum trialkyl compound with an aluminumalkyl halide.

19. (Original) The catalyst according to claim 15, in which the external electron donor compound is a C₂-C₂₀ aliphatic ether.

20. (Previously presented) The catalyst according to claim 19, in which the aliphatic ether is tetrahydrofuran.

21. (Previously presented) The catalyst according to claim 15, in which the external electron donor compound is a silicon compound of formula $R_a^5R_b^6Si(OR^7)_c$, where a is 0, b is 1, c is 3, R^6 is a branched alkyl or cycloalkyl group, optionally containing heteroatoms, and R^7 is methyl.

22. (Original) The catalyst according to claim 15, which is obtained by pre-contacting the components (a), (b) and optionally (c) for a period of time ranging from 0.1 to 120 minutes at a temperature ranging from 0 to 90°C.

23. (Original) The catalyst according to claim 22, in which the pre-contact is carried out in the presence of small amounts of olefins, for a period of time ranging from 1 to 60 minutes, in a liquid diluent, at a temperature ranging from 20 to 70°C.

24. (Previously presented) The catalyst according to claim 15, which is pre-polymerized with at least one olefin of formula $CH_2=CHR$, where R is H or a C1-C10 hydrocarbon group, up to forming amounts of polymer from about 0.1 up to about 1000 g per gram of solid catalyst component (a).

25. (Currently amended) A process comprising (co)polymerizing olefins $CH_2=CHR$, wherein R is hydrogen or a hydrocarbon radical having 1-12 carbon atoms, carried out in the presence of a catalyst comprising a product obtained by contacting:

(a) a solid catalyst component comprising Mg, [[Ti]] a titanium compound selected from titanium tetrahalides, or of formula $TiX_n(OR^1)_{4-n}$, wherein $0 \leq n \leq 3$, X is halogen,

and R¹ is C₁-C₁₀ hydrocarbon group, a halogen, and an electron donor compound (ED) selected from ethers, esters, amines, ketones, or nitriles, wherein a molar ratio Mg/Ti is higher than 5, and a molar ratio ED/Ti is higher than 3.5;

(b) at least one aluminum alkyl compound and, optionally,

(c) an external electron donor compound.

26. (Original) The process according to claim 25, for the preparation of an ethylene/alpha olefin copolymer having a content of alpha olefin ranging from 0.1 to 20% by mol.

27. (Currently amended) The process according to claim 26, wherein the process is carried out in gas-phase.

28. (Previously presented) The process according to claim 27 further comprising the following steps:

(i) contacting the catalyst components (a), (b) and optionally (c) for a period of time ranging from 0.1 to 120 minutes, at a temperature ranging from 0 to 90°C; optionally

(ii) pre-polymerizing with at least one olefin of formula CH₂=CHR, where R is H or a C₁-C₁₀ hydrocarbon group, up to forming amounts of polymer from about 0.1 up to about 1000 g per gram of solid catalyst component (a); and

(iii) polymerizing in the gas-phase ethylene, or mixtures thereof with α-olefins CH₂=CHR in which R is a hydrocarbon radical having 1-10 carbon atoms, in at least one fluidized or mechanically stirred bed reactor, in the presence of a product formed in steps (i) or (ii).